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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/625,550

07/24/2003

Young-Woo Kim

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04/25/2005

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EXAMINER

LEPISTO, RYAN A

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/625,550

Applicant(s)

KIM ET AL.

Examiner

Ryan Lepisto

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-15 is/are allowed.
- 6) ☒ Claim(s) 1 and 3 is/are rejected.
- 7) ☒ Claim(s) 2 and 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1 and 3** are rejected under 35 U.S.C. 102(b) as being anticipated by **Wiley (US 4,854,038)**. Wiley teaches the process of forming a printed circuit board (Figs. 1-6) comprising the steps of forming a plurality of via holes (13) in a plurality of copper clad (2, 4, 5) laminates (10) using a drill (column 3 lines 20-33, which implies a bit), plating the inner wall of each via hole (Fig. 4, column 3 lines 31-33), exposing and etching copper plated portions of both sides of the laminates to form a circuit pattern (column 41-42), layering the patterned copper clad laminates (10) on each other using an insulating resin adhesive (9) (column 3 lines 37-38, Fig. 6) wherein as is seen by the hatching in Fig. 6, the resin adhesive fills the space between the copper clad laminates (10) and the via holes and removing the insulating resin adhesive where needed to form additional plated through-holes (17) (column 3 lines 50-52, Fig. 6, again, implying a bit is used).

### ***Allowable Subject Matter***

2. **Claims 5-15** are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 5, 8 and 12: These claims are allowable over the prior art of record because the latter, either alone or in combination, does not disclose nor render obvious a process of forming opto-vias comprising creating copper clad laminates with circuit patterns, layering them on top of each other, drilling electric and opto-vias holes, plating the holes, etching both sides of the laminates and drilling additional opto-vias in the order as disclosed in the claims or positioning a waveguide through each opto-via in a structure formed by stacking a plurality of copper clad laminates with circuit patterns and plated via holes using a resin adhesive and removing the resin to form vias, in combination with the rest of the claimed limitations.

With regard to claims 6-7, 9-11, 13-15: These claims are allowable over the prior art of record because they depend on allowable claims.

3. **Claims 2 and 4** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following reference show the state of the prior art at the time of applicant's invention, specifically, multi-layered PCBs using individual layers adhered

Art Unit: 2883

together followed by forming vias: Muraki (US 6,005,766), Anstrom et al (US 6,832,436 B2), Takahashi et al (US 4,526,835), Bindra et al (US 5,129,142), Chang et al (US 5,191,174), Dux et al (US 5,224,265), Frankeny et al (US 6,098,282), Li et al (US 6,499,214 B2), Muramatsu et al (US 6,730,859 B2), Yuri et al (US 2004/0238209 A1), Egitto et al (US 6,826,830 B2).

### ***Response to Arguments***

5. Claim 5, as amended, overcomes the previous 35 U.S.C 112 rejection.
6. Applicant's arguments, filed 14 March 2005, with respect to the rejection(s) of claim(s) 1-3, 5, 8-10 and 12 under 35 U.S.C 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wiley as described above.

The combination of Booth and Tsukamoto do fail to teach removing the insulating resin to form opto-vias. Booth does disclose an insulating resin adhesive as in that the resin separates two laminates. Booth does not disclose an electrically insulating resin adhesive. Adding electrically insulated to the claim language would better distinguish this aspect of the applicant's invention.

7. For the same reason described above, the rejection of claims 4, 6-7, 11 and 13 are overcome due to applicant's amendment and arguments above.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ryan Lepisto

Art Unit 2883

Date: 4/12/05



Frank Font

Supervisory Patent Examiner

Technology Center 2800